REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections contained in the Office Action of February 8, 2006 is respectfully requested.

By this Amendment, claims 1, 2, 4, 7, 9 and 11 have been amended, claims 3, 6 and 22-36 have been cancelled and new claim 38 has been added. Thus, claims 1, 2, 4, 5 and 7-38 are currently pending in the application, claims 5, 8, 10, 12-21 and 37 having been withdrawn from consideration. No new matter has been added by these amendments.

On pages 2-3 of the Office Action, claims 1-4, 6, 7, 9 and 11 were rejected under 35 U.S.C. § 102(b) as being anticipated by Maruyama (US 2002/0025260), as well as by Maruyama et al. (US 2001/0043864).

Applicants would like to thank the Examiner for his courtesy in granting and conducting the telephone interview of May 11, 2006 in which the rejections of the original claims were discussed. In particular, the limitations of original dependent claim 3 were discussed, and the Examiner acknowledged that the limitations of original dependent claim 3 did not appear to be disclosed by the prior art. In view of that discussion, independent claim 1 has been amended to include the limitations of original dependent claim 3, and for the reasons discussed below, it is respectfully submitted that independent claim 1, as amended, is clearly patentable over the prior art of record.

Independent claim 1, as amended, recites a method for discharging fluid which includes feeding fluid from a fluid supply device to a gap formed by two opposing surfaces of two members, while keeping the two members moving relative to each other along a gap direction of the gap. The method also includes intermittently discharging the fluid by utilizing a pressure change made by changing the gap, and controlling a fluid discharge amount per dot depending on pressure and flow rate characteristics of the fluid supply device.

The method further includes setting the gap to have a minimum value h_0 such that the intermittent discharging is performed while $h_0 > h_x$. As further recited in independent claim 1, and as shown in Fig. 14b, the intermittent discharge amount per dot is generally proportional to the minimum value h_0, and is represented by a curved line, when h_0 is in the range of $0 < h_0 < h_x$. A first straight line is tangent to the curved line at a portion near $h_0 = 0$ (shown as line I in Fig. 14b). The intermittent discharge amount per dot is generally constant independent of the minimum

value h_0 when $h_0 > h_x$, and is represented by a second straight line (shown as line II in Fig. 14b). An intersection point between the first straight line and the second straight line is defined as $h_0 = h_x$.

Maruyama ('260) discloses a fluid discharge method in which a piston 4 and a sleeve 3 are moved relative to each other, while fluid 13 is supplied to a pump chamber 12 defined by the piston 4, the movable sleeve 3 and the housing 6. The gap between the piston 4 and the opposing surface of the housing 6 has a value X_p, and a gap between the sleeve 3 and the opposing surface of the housing 6 has a value of X_s. However, the '260 reference does not disclose a method in which the gap is set to have a minimum value in the manner recited in amended independent claim 1.

In particular, the '260 reference does not disclose setting a minimum gap value based on the intersection of two straight lines, one being tangent to a curved line representing the generally proportional relationship of the intermittent discharge amount per dot to the minimum gap value, and the other being a straight line representing a generally constant and independent relationship of the intermittent discharge amount per dot to the minimum gap value. Rather, the '260 reference does not disclose a step of determining a minimum gap value, and only discloses, as shown in Fig. 26, the correlation of varying gap values X_p and a constant gap value X_s which produce positive or negative flow rates. Accordingly, it is respectfully submitted that the '260 reference does not disclose all of the limitations of amended independent claim 1.

Maruyama ('864) discloses a fluid discharge device which, as generally shown in Fig. 2, includes a main shaft 2 being rotated and axially driven within in a cylinder 4. A fluid is supplied to a discharge nozzle 9 via a series of radial grooves 5, 6 on the outer periphery of the main shaft 2 as the main shaft 2 is rotated.

Figs. 12A and 12B are directed to a method of performing on/off control of the fluid discharge through the use of thrust type grooves on the discharge-end side portions of the central shaft 950 and the surrounding outer peripheral shaft 951. A sealing groove 957 is provided on the discharge end of the central shaft 950, and a pumping groove 958 is provided on the discharge side of the outer peripheral shaft 951.

On/off control is performed by decreasing the gap between the outer peripheral shaft 951 and the bottom surface of the housing such that the pumping groove 958 feeds the fluid to the

discharge nozzle 954 against the pumping pressure of the sealing groove 957. By increasing the gap between the outer peripheral shaft 951 and the bottom surface of the housing, the pumping pressure of the pumping groove 958 decreases such that the discharge of the fluid is shut off by the sealing groove 957.

However, the '864 reference does not disclose a method in which the gap is set at a minimum value as recited in amended independent claim 1. In particular, the '864 reference does not disclose setting a minimum gap value based on the intersection of two straight lines, one being tangent to a curved line representing the generally proportional relationship of the intermittent discharge amount per dot to the minimum gap value, and the other being a straight line representing a generally constant and independent relationship of the intermittent discharge amount per dot to the minimum gap value. Rather, the '864 reference only discloses adjusting the gap between the outer peripheral shaft and the bottom surface of the housing to either enable the discharge of fluid or to completely shut off the discharge of fluid, due to the pressures created by the thrust type grooves. Accordingly, it is respectfully submitted that the '864 reference does not disclose all of the limitations of amended independent claim 1.

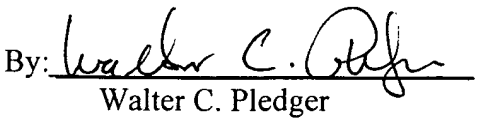
Therefore, it is respectfully submitted that independent claim 1, as well as claims 2, 4, 7, 9, 11 and 38 which depend therefrom, are clearly allowable over the prior art of record.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice to that effect is respectfully solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

Teruo MARUYAMA et al.

By: 

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June 12, 2006